

## AMENDMENTS TO THE SPECIFICATION

Please replace paragraph beginning at page 1, line 13 with the following amended paragraph:

12 In an air conditioner comprising an indoor unit and outdoor unit, a heat exchanger 1 of a type, for example, as shown in Figure 4(A) is mounted in the indoor unit, and a heat exchanger 2 of a type as shown in Figure 4(B) is mounted in the outdoor unit. Each heat exchanger is comprised of a heat transfer fin unit in which heat transfer ~~coils~~tubes 4, through which a cooling medium flows, penetrate through a row of multiple heat transfer fins set at a specified fin pitch.

Please replace paragraph beginning at page 1, line 24 with the following amended paragraph:

23 An example of the subject of the present invention is shown in Figure 3, whereby four relatively wide slits are formed on the surface of a heat transfer fin. In this figure, 31, 32 are two heat transfer fin units which comprise a heat exchanger, 4 is a heat transfer ~~coil~~tube, and 61, 62, 63, 64 are four slits formed, in order from the left, on the surface of a heat transfer fin. Each of these slits is pushed out to form a slope. In the diagram, numbering of the same slits formed for each of the other heat transfer ~~coils~~tubes of heat transfer fin units 31 and 32 is omitted.

Please replace paragraph beginning at page 2, line 7 with the following amended paragraph:

24 Slit 61 is positioned relative to the air flow in front of heat transfer ~~coil~~tube 4, while slit 64 is positioned behind said heat transfer ~~coil~~tube. Slits 62, 63 are formed between a heat transfer ~~coil~~tube 4 and another heat transfer ~~coil~~tube 4. This slit configuration is the same for each of the other heat transfer ~~coils~~tubes of heat transfer fin units 31, 32.

Please replace the paragraphs from line 1, page 3 to line 24, page 4 with the following amended pages:

25 A heat exchanger characterized as follows is provided to achieve the aforementioned objective. As claimed in Claim 1 of the present invention, a heat exchanger in which heat transfer ~~coils~~tubes penetrate through a row of multiple plate-shaped heat transfer fins set at a

specified fin pitch and in which air is supplied orthogonally to said heat transfer ~~coils~~-tubes, is configured so as to satisfy the correlation expressed by the following numerical formula:

$$W_s \geq (1 - 0.16(6 - N)) \times W_F / (2N + 1)$$

wherein,  $W_s$  = width of a slit,  $W_F$  = width of a heat transfer fin, and  $N$  = the number of slit arrays / or number of heat transfer fin units.

As claimed in Claim 2 of the present invention, a heat exchanger in which heat transfer ~~coils~~-tubes penetrate through a row of multiple plate-shaped heat transfer fins set at a specified fin pitch and in which air is supplied orthogonally to said heat transfer ~~coils~~-tubes, is configured such that the width of each slit formed orthogonal to the air flow on each heat transfer fin is set within a range of 0.17 - 0.29 times the diameter of the heat transfer ~~coils~~-tubes.

As claimed in Claim 3 of the present invention, a heat exchanger in which heat transfer coils penetrate through a row of multiple plate-shaped heat transfer fins set at a specified fin pitch and in which air is supplied orthogonally to said heat transfer ~~coils~~-tubes, is configured such that the spacing between slits formed on the heat transfer fins is set within a range of 0.18 - 0.5 times the diameter of the heat transfer ~~coils~~-tubes.

As claimed in Claim 4 of the present invention, a heat exchanger in which heat transfer ~~coils~~-tubes penetrate through a row of multiple plate-shaped heat transfer fins set at a specified fin pitch and in which air is supplied orthogonally to said heat transfer ~~coils~~-tubes, is configured such that the width of each slit formed on each heat transfer fin is set within a range of 0.17 - 0.29 times the diameter of the heat transfer ~~coils~~-tubes, and the spacing between slits formed on the heat transfer fins is set within a range of 0.18 - 0.5 times the diameter of the heat transfer ~~coils~~-tubes.

By setting the slit width and the slit spacing at an optimum range in this manner, the heat exchange amount (efficiency) of the slits can be increased, thereby improving the heat transfer efficiency of the heat exchanger.

As claimed in Claim 5 of the present invention, a heat exchanger in which heat transfer ~~coils~~-tubes penetrate through a row of multiple plate-shaped heat transfer fins set at a specified fin pitch and in which air is supplied orthogonally to said heat transfer coils tubes, is configured such that within the plural number of slit arrays formed on a heat transfer fin, within a given array each slit formed on either edge of a heat transfer fin is partitioned into slits of different

length, and the position at which the slit is so partitioned on each of the two sides of said heat transfer fin is staggered.

As claimed in Claim 5 of the present invention, a heat exchanger in which heat transfer ~~coils~~tubes penetrate through a row of multiple plate-shaped heat transfer fin set at a specified fin pitch and in which air is supplied orthogonally to said heat transfer ~~coils~~tubes, is configured such that of the plural number of slits formed on a heat transfer fin, except for those slits formed between two heat transfer ~~coils~~tubes, adjoining slits in the vertical direction are of mutually different length, and the position at which the slits are partitioned is staggered.

In this manner, air resistance is not governed by the number of slits and is virtually uniform, and the wind speed at the center varies only slightly from the wind speed above or below the center. There is also no uneven distribution of air flow at the center. Consequently, the air contacts all slits uniformly for an effective utilization of the slits to increase the heat transfer efficiency of the heat exchanger.

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Please replace paragraph beginning at page 5, line 13 with the following amended paragraph:

As shown in Figure 1, a heat transfer fin is configured from heat transfer ~~coil~~tube 4, and slits 51, 52, 53, 54, 55, 56 cut and formed on the surface of a heat transfer fin, wherein slits 51, 52 are located in front of the heat transfer ~~coil~~tube 4, and slits 55, 56 are located behind said heat transfer ~~coil~~tube, and slits 52, 55 are longer than slits 51, 56. These slits are pushed out to form a square angle.

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Please replace paragraph beginning at page 5, line 17 with the following amended paragraph:

Partitioned slits 51 and 52 formed in front of the heat transfer ~~coil~~tube 4 and slits 55 and 56 formed behind said heat transfer ~~coil~~tube 4 are arranged so there is a mutually different length among adjoining partitioned slits in the vertical direction, as well as a mutually different length between directly opposite partitioned slits in the horizontal direction. As a result, the position at which the slits are partitioned is staggered. However, slits 53 and 54 formed side by side between heat transfer ~~coil~~tube 4 and heat transfer ~~coil~~tube 4 are of the same length.

Please replace paragraph beginning at page 6, line 4 with the following amended paragraph:

There is also no uneven distribution of air flow at the center. Consequently, the air makes equal contact with all slits for an effective utilization of the slits, thereby increasing the heat transfer efficiency of the heat exchanger. Simulation trials were also conducted with respect to slit width and slit spacing, and it was discovered that there is a correlation between an optimum range of slit width and slit spacing as shown by the heat exchange amount and pressure drop characteristics in Figure 2. Measurements were obtained using a 7 mm diameter heat transfer ~~coil~~ tube, and the correlation between slit width versus heat exchange amount (efficiency) and slit width versus pressure drop (loss) are shown in Figure 2(A). The Correlation between slit spacing versus heat exchange amount (efficiency) and slit spacing versus pressure drop (loss) are shown in Figure 2(B).

Please replace paragraph beginning at page 1, line 13 with the following amended paragraph:

The results indicate that the optimum relationship between slit width and slit spacing is one which satisfies the following numerical formula for a heat transfer fin configuration of 6 slits or less per width of one fin array:

$$W_s \geq (1 - 0.1(6 - N)) \times W_F / (2N + 1)$$

wherein,  $W_s$  = width of a slit,  $W_F$  = width of each of heat transfer fin unit 31, 32, (namely the width of one fin array) and  $N$  = the number of slit arrays ~~+~~ or number of heat transfer fin units.

Please replace paragraph beginning at page 6, line 21 with the following amended paragraph:

Namely, the optimum slit width  $W_s$  for high efficiency of heat transfer ranges from 1.2 - 2.0 mm, and the optimum slit spacing for high efficiency ranges from 2.0 - 3.5 mm. Converting these values with the diameter of the heat transfer ~~coil~~ tube as a reference, the optimum slit width for high heat transfer efficiency ranges from  $1.2/7$  (approximately 0.17) to  $2.0/7$  (approximately 0.29) times the diameter of the heat transfer ~~coil~~ tube.

Please replace paragraph beginning at page 7, line 2 with the following amended paragraph:

Similarly, the optimum slit spacing for high heat transfer efficiency ranges from  $1.3/7$  (approximately 0.18) to  $3.5/7$  (approximately 0.5) times the diameter of the heat transfer ~~coil~~ tube. Moreover, it was discovered from measurements taken with heat transfer ~~coils~~ tubes of different diameter that the optimum ranges were generally the same as the aforementioned values.

Please replace paragraph beginning at page 7, line 7 with the following amended paragraph:

As a result of various simulation experiments as described above, it was discovered that the heat transfer efficiency of a heat exchanger could be increased by using the heat transfer fins of the present invention, in which the position at which slits are partitioned is staggered, and the slit width and/or slit spacing is set within a specified range relative to the diameter of the heat transfer ~~coils~~ tubes.

Please replace paragraph beginning at page 7, line 12 with the following amended paragraph:

In the heat exchanger of the present invention as described above, the slits formed on a heat transfer fin are formed such that with the exception of the slits formed between heat transfer ~~coils~~ tubes which are of equal length, the other slits are formed such that adjoining partitioned slits in the vertical direction are of mutually different length, and the position at which the slits are partitioned is staggered. Then by setting the slit width and/or the slit spacing formed on a heat transfer fin within a specified range relative to the diameter of the heat transfer ~~coil~~ tube, the intake air will be in contact with all slits uniformly. This effective utilization of the slits will increase the heat transfer efficiency of the heat exchanger.